

## **APPARATUS AND METHODS FOR HANDLING AND CONTROLLING THE NURTURING OF PLANTS**

### **ABSTRACT**

Apparatus for handling and controlling the nurturing of plants comprises a greenhouse for providing a first environmental zone for nurturing plants, a plant warehouse for providing a second environmental zone for nurturing plants, transport rails extending from within the first environmental zone to within the second environmental zone, and a plurality of ebb and flood trays. The first environmental zone is located in the greenhouse in a region positioned to receive substantial amounts of sunlight. The second environmental zone is located in the warehouse in a region substantially sheltered from sunlight.

The ebb and flood trays each include a valve for controlling fluid flow into and out from a flood region within the tray. The valve includes means for receiving a fluid flow from an external source of fluid through a top end of the valve and, in response to the flow, for diverting the flow into the flood region of the tray. Further the valve includes means responsive to the absence of the flow for permitting fluid from the flood region to drain through a bottom end of the valve.

A method of handling and controlling the nurturing of plants in an ebb and flood tray includes the steps of maintaining first and second environmental zones for nurturing plants; maintaining transport rails extending from within the first environmental zone to within the second environmental zone, adapting the tray for riding movement on the rails, positioning the tray on the rails for such movement, and carrying the plants in the tray. The first zone is located in a structure in a region positioned to receive substantial amounts of sunlight. The second zone is located in a structure in a region substantially sheltered from sunlight. At a first time, and if a first prescribed condition is satisfied, the tray with the plants is moved along the rails from within the first environmental zone to within the second environmental zone. At a subsequent time, and if a second prescribed condition is satisfied, the tray with the plants is moved along the rails from within the second environmental zone to within the first environmental zone.